U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-260 219

RADIUM MONITORING NETWORK

DATA RELEASE NUMBER 4

PUBLIC HEALTH SERVICE, DENVER, COLORADO

JANUARY 1964

257060

PB 260 219

RADIUM MONITORING NETWORK

Data Release No. 4

U. S. Department of Health, Education, and Welfare
Public Health Service
Bureau of State Services
Division of Water Supply and Pollution Control
Region VIII
Denver, Colorado

Colorado River Basin Water Quality Control Project

January 1964

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SPRINGFIELD, VA. 22161

BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-260 219
4. Title and Subtitle Radium Monitoring Network. Data Release Number 4.			5. Report Date Jan 64 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Public Health Service, Denver, Colo. Div. of Water Supply and Pollution Control.			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered 14.

15. Supplementary Notes

Report on Colorado River Basin Water Quality Control Project.

16. Abstracts

This is the fourth release of data collected through the Radium Monitoring Network of the Colorado River Basin Water Quality Control Project, and it supplements the data presented in three previous releases dated October 1962, January 1963, and July 1963. The Network is a surveillance system consisting of surface water sampling stations at 26 locations throughout the basin, and it assays the radiological content of river waters in the basin on a continuous basis. As a whole, the data for dissolved radium-226 are below the currently accepted MPC value for radium in drinking water. Tabular data are given.

17. Key Words and Document Analysis. 17a. Descriptors

17b. Identifiers/Open-Ended Terms

Colorado River
Dolores River
River basins
*Radium
Drinking water
*Radiation hazards
Water supply
*Water quality data
Water pollution sampling
State agencies
Surface waters
Tables(Data)
*Uranium
Mining
Radioactive wastes
Industrial wastes
Fallout

17c. COSATI Field/Group 13B

18. Availability Statement	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 48
	20. Security Class (This Page UNCLASSIFIED	22. Price

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

DATA RELEASE #4

ERRATA SHEET

Radium-226 data on eight questionable results have been rechecked, and the corrected values listed below:

RMN Station	Composite Period		Ra-226, µµg/l	
	First Date	Last Date	Prev. Result	Amended Result
24	9/23/62	9/29/62	0.68	0.05
15	9/ 3/62	9/ 8/62	0.05	0.21
15	9/10/62	9/15/62	0.21	0.18
15	9/17/62	9/22/62	0.18	0.20
15	9/24/62	9/28/62	0.20	0.21
25	9/17/62	9/22/62	0.21	0.04
25	9/24/62	9/29/62	0.04	0.05
26	9/ 3/62	9/ 4/62	0.05	0.68

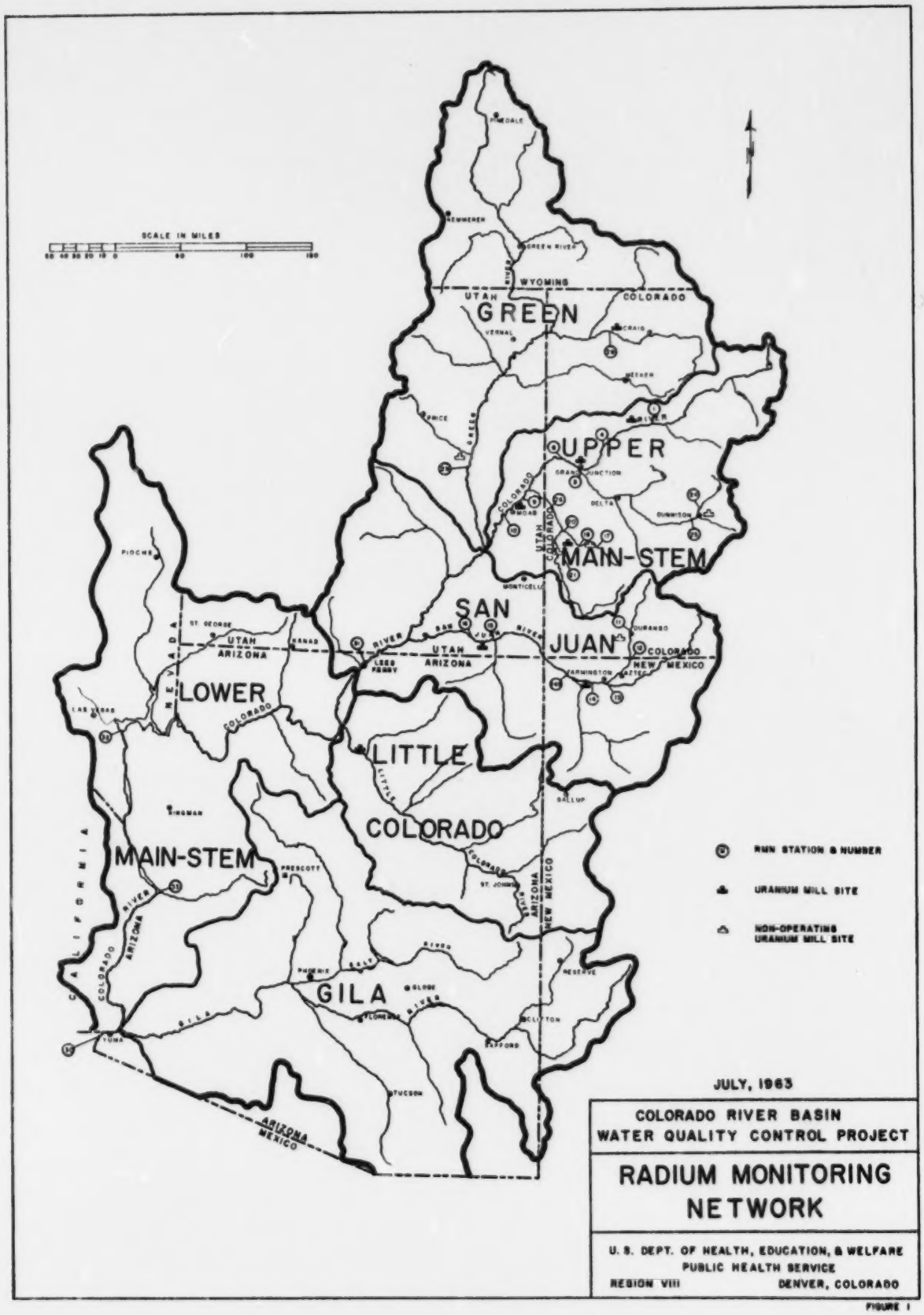

SCALE IN MILES
WYOMING
UTAH
COLORADO
GREEN
UPPER
MAIN-STEM
SAN
JUAN
NEW MEXICO
LOWER
LITTLE
COLORADO
MAIN-STEM
GILA
NEVADA
CALIFORNIA
ARIZONA
RMN STATION & NUMBER
URANIUM MILL SITE
NON-OPERATING URANIUM MILL SITE
JULY, 1963
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM MONITORING NETWORK
U. S. DEPT. OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION VIII
DENVER, COLORADO

FIGURE 1

COLORADO RIVER BASIN WATER QUALITY CONTROL PROJECT

RADIUM MONITORING NETWORK

INTRODUCTION

This is the fourth release of data collected through the Radium Monitoring Network of the Colorado River Basin Water Quality Control Project of the Division of Water Supply and Pollution Control, U. S. Public Health Service, U. S. Department of Health, Education and Welfare. This release is to supplement the data presented in three previous releases dated October 1962, January 1963, and July 1963.

The Radium Monitoring Network is a surveillance system presently consisting of surface water sampling stations at twenty-six locations throughout the Colorado River Basin. The purpose of this network is to assay the radiological content of river waters in the Colorado River Basin on a continuous basis. The Radium Monitoring Network was established after its need was recognized at a 1957 conference on uranium milling wastes attended by representatives of the States of Arizona, Colorado, New Mexico, and Utah, and the U. S. Public Health Service.

DISCUSSION

Radium-226

Appended Radium Monitoring Network (RMN) data to that presented in the three previous data releases are given in the Appendix.

When viewed as a whole*, with the exception of two values at RMN Station 26, one at RMN Station 10, and one at RMN Station 20, all of the reported data for dissolved radium-226 are below the currently accepted MPC value of 3.0 μμg/l for radium in drinking water.1/

Combining data from all RMN stations gives comparisons shown below. Background stations are those unaffected by uranium mining and milling activities.

	Background Stations	Non-background Stations	All Stations
Average Ra-226	0.08μμg/l	0.43μμg/l	0.37μμg/l
Range	0.0-0.68μμg/l	0.01-7.21μμg/l	0.0-7.21μμg/l
No. of samples	112	595	707

* Discussion herein is representative of all results shown in this report (Data Release No. 4) and that reported in previous Data Releases Nos. 1, 2, and 3.

1/ U. S. Public Health Service Drinking Water Standards, 1962 Edition.

Figure 1 and Table I present in pictorialand tabular form the average levels of radium-226 content in surface waters of the Colorado River Basin. These are average values of all RMN data released to date.

The influence of various uranium milling operations on radium-226 levels can be readily seen in these displays, particularly on the Dolores-San Miguel River sub-basin system, where both operating and non-operating mills exert their influence from present and past discharges to the streams. The 1.14 μμg/l value at Gateway on the Dolores River is the only average figure above the suggested 1.0 μμg/l desirable maximum for Basin waters [1/].

At mill locations where discharges to the stream have been or are relatively light, such as at Maybell, Gunnison, and Shiprock, the change in radium-226 levels in the stream is practically negligible.

Figures 3 through 7 present further graphical illustrations of radium-226 levels in various rivers. The horizontal segments of the plotted lines in these figures indicate the average radium-226 levels for each particular month as recorded by the RMN stations. A hydrograph [2/] has been plotted in each figure to provide comparisons of river flow and radium-226 levels.

Uranium

Results of uranium analyses on RMN samples provide the following comparisons.

	Background Stations	Non-background Stations	All Stations
Average uranium	2.0 μg/l	10.1 μg/l	9.1 μg/l
Range	0.0-5.5 μg/l	0.0-150.0 μg/l	0.0-150.0 μg/l
No. of samples	45	338	383

Figure 2 and Table II present the average levels of uranium content in surface waters of the Colorado River Basin.

Again the influence of various uranium milling operations can be seen, although natural increases of uranium in downstream reaches appear more predominantly than any natural radium increases. The dilution effect of merging streams is apparent in both Figures 1 and 2.

Another tentative thought appearing in Figures 1 and 2 is that certain streams tend to relieve themselves of both soluble uranium and radium, probably to the sediments. The degree of this phenomenon most likely would depend upon stream volume, velocity, distance of travel and type of geologic material it flows through.

1/ Transcript, Third Session Conference on Pollution of the Interstate Waters of the Colorado River and Its Tributaries, Salt Lake City, Utah, p. 43, May 1962.

2/ Hydrograph flow values were obtained from the U.S. Geological Survey Surface water Records for water year 1962.

Gross Alpha and Lead 210

Although there are not sufficient gross alpha or lead 210 data available from the RMN at this time to warrant any discussions or conclusions, the initial data that are available are given in the Appendix.

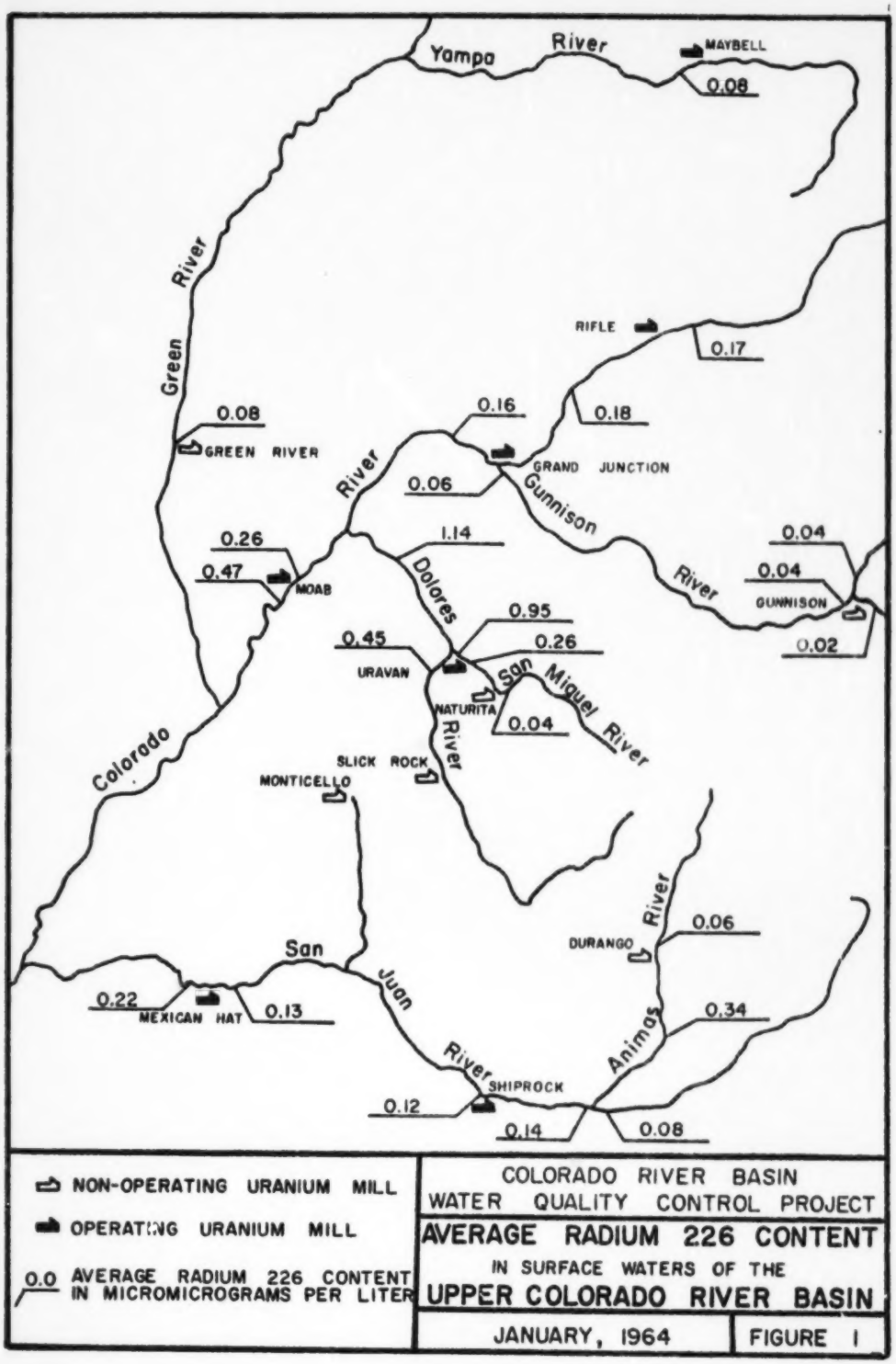

Yampa River
MAYBELL
0.08
Green River
RIFLE
0.17
0.08
GREEN RIVER
0.16
0.18
GRAND JUNCTION
River
0.06
Gunnison River
0.26
1.14
0.04
0.47
MOAB
Dolores
0.04
GUNNISON
0.95
0.02
0.45
0.26
URAVAN
San Miguel River
NATURITA
0.04
Colorado
SLICK ROCK
River
MONTICELLO
River
0.06
DURANGO
San Juan River
0.22
MEXICAN HAT
0.13
Animos
0.34
SHIPROCK
0.12
0.14
0.08
NON-OPERATING URANIUM MILL
OPERATING URANIUM MILL
0.0 AVERAGE RADIUM 226 CONTENT IN MICROMICROGRAMS PER LITER
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
AVERAGE RADIUM 226 CONTENT
IN SURFACE WATERS OF THE
UPPER COLORADO RIVER BASIN
JANUARY, 1964
FIGURE 1

TABLE 1

Average Radium-226 Content
Colorado River Basin

RMN Location	Avg. Radium μμg/l	Range μμg/l	No. of Analysis
San Miguel River			
#17 above Naturita	0.04	0.0 -0.09	37
#18 above Uravan	0.26	0.05 -1.24	70
#20 below Uravan	0.95	0.11 -4.84	68
Dolores River			
#21 at Bedrock	0.45	0.03 -1.00	22
#26 at Gateway	1.14	0.04 -3.28	61
Gunnison River			
#22 on Tomichi Creek	0.02	0.005-0.039	7
#24 above Gunnison	0.04	0.021-0.080	19
#25 below Gunnison	0.04	0.010-0.09	22
# 5 at Grand Junction	0.06	0.01 -0.10	18
Colorado River (Upper Basin)			
# 1 at Silt	0.17	0.04 -0.28	23
# 4 De Beque	0.18	0.05 -0.44	24
# 6 at Fruita	0.16	0.09 -0.26	18
# 9 above Moab	0.26	0.10 -0.50	54
#10 below Moab	0.47	0.18 -7.21	48
Animas River			
#11 above Durango	0.06	0.04 -0.08	15
#12 Colorado-New Mexico line	0.34	0.09 -1.51	70
San Juan River			
#13 above Farmington	0.08	0.03 -0.16	10
#14 below Farmington	0.14	0.08 -0.21	10
#14S below Shiprock	0.12	0.04 -0.20	13
#15 above Mexican Hat	0.13	0.08 -0.23	22
#16 below Mexican Hat	0.22	0.09 -0.54	27

Table I (continued)

RMN Location		Avg. Radium μμg/l	Range μμg/l	No. of Analysis
Green River				
#28	below Maybell	0.08	0.03 -0.15	13
#29	at Green River	0.08	0.05 -0.10	12
Colorado River (Lower Basin)				
#31	at Page	0.33	0.29 -0.36	2
#32	Lake Mead	0.38	0.36 -0.40	4
#33	Lake Havasu	0.36	0.26 -0.40	5
#30	at Yuma	0.16	0.06 -0.32	15

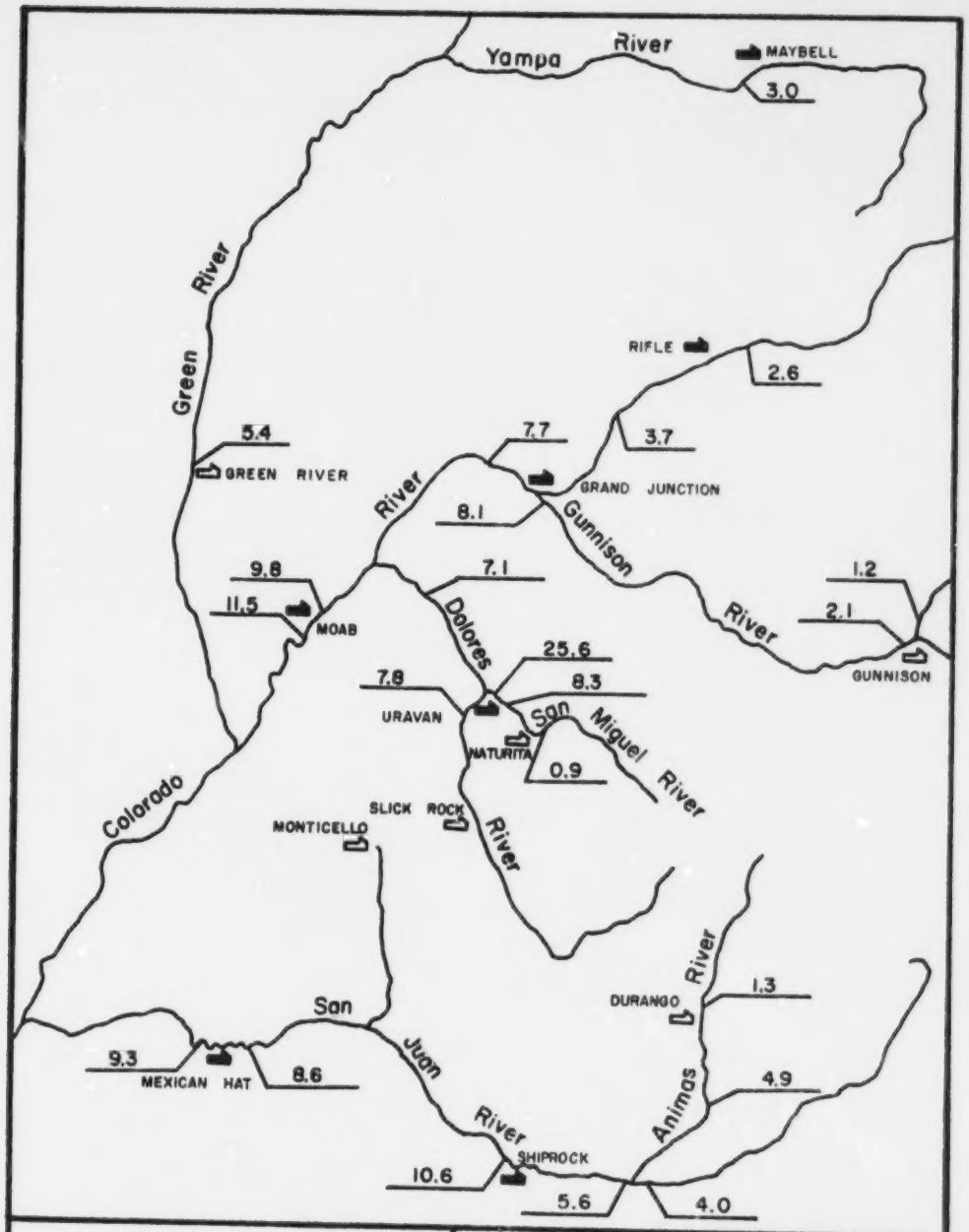

Yampa River
MAYBELL
3.0
Green River
RIFLE
2.6
5.4
GREEN RIVER
7.7
3.7
GRAND JUNCTION
River
8.1
Gunnison
9.8
7.1
1.2
11.5
MOAB
Dolores
River
2.1
25.6
GUNNISON
7.8
8.3
URAVAN
San Miguel River
NATURITA
0.9
Colorado
SLICK ROCK
MONTICELLO
River
San Juan River
DURANGO
1.3
Animas River
9.3
MEXICAN HAT
8.6
4.9
SHIPROCK
10.6
5.6
4.0
NON-OPERATING URANIUM MILL
OPERATING URANIUM MILL
0.0 AVERAGE URANIUM CONTENT IN MICROGRAMS PER LITER
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
AVERAGE URANIUM CONTENT
IN SURFACE WATERS OF THE
UPPER COLORADO RIVER BASIN
JANUARY, 1964
FIGURE 2

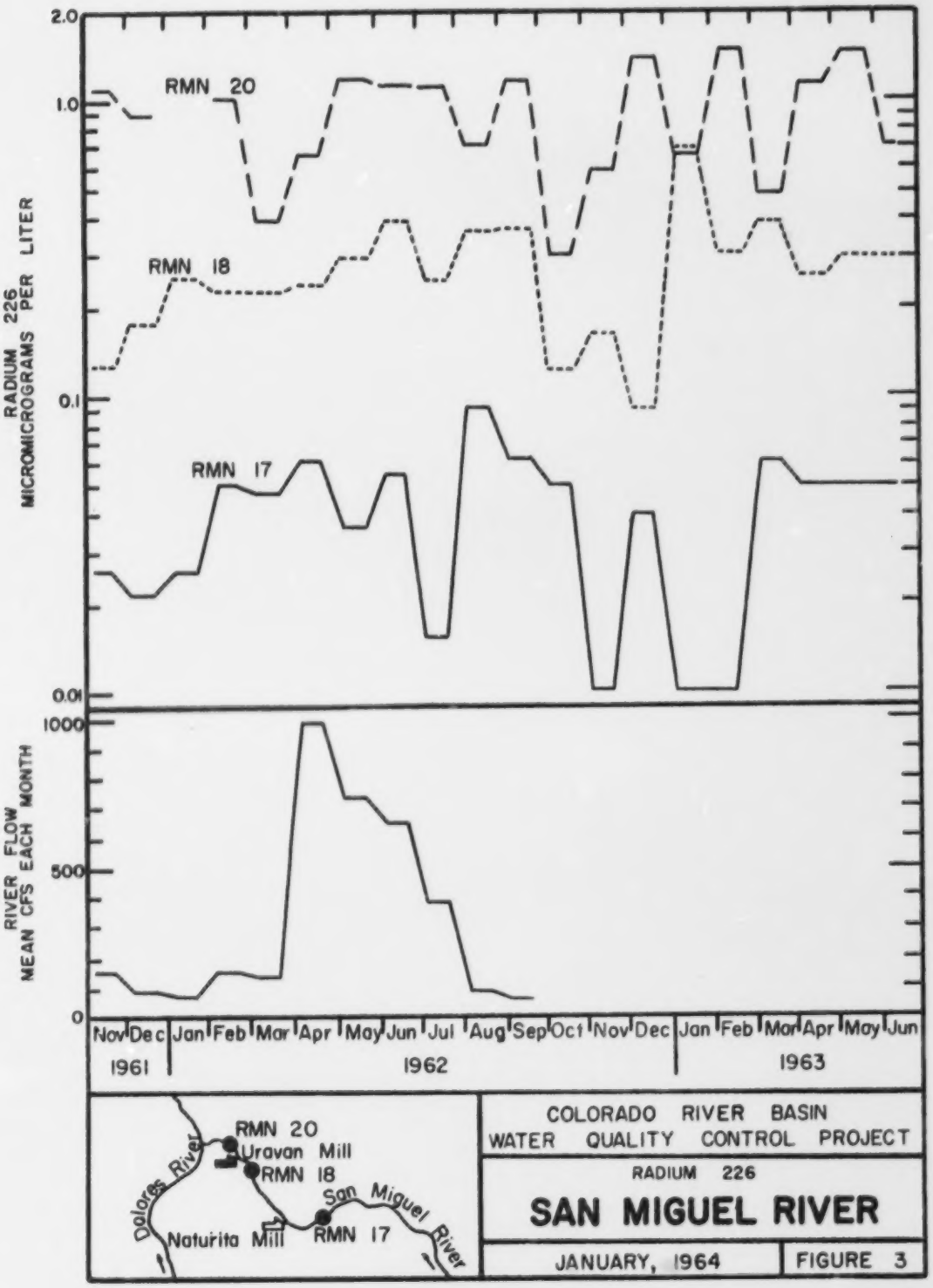
TABLE II

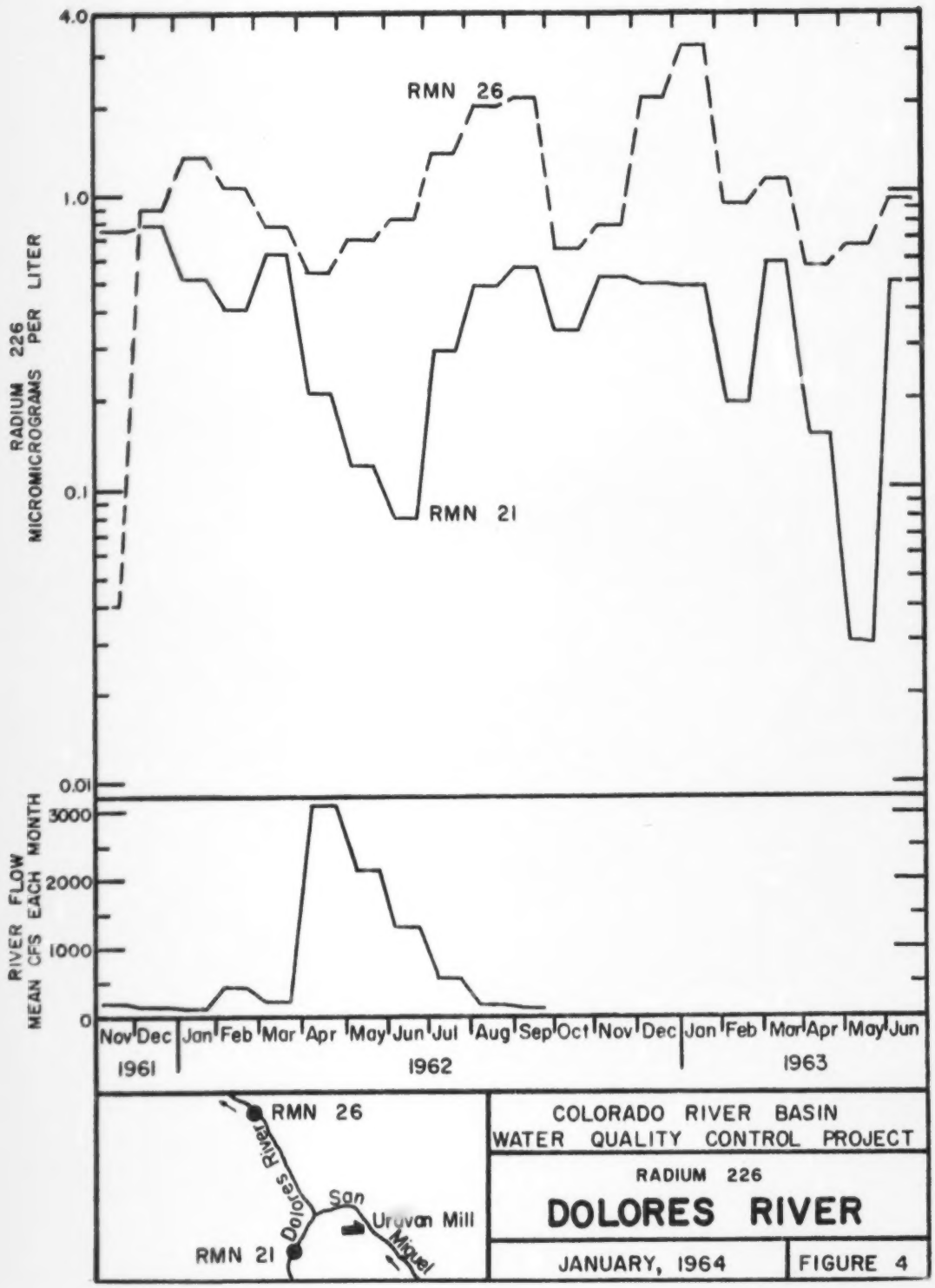
Average Uranium Content
Colorado River Basin

RMN Location		Avg. Uranium µg/l	Range µg/l	No. of Analysis
San Miguel River				
#17	above Naturita	0.9	0.0- 2.1	9
#18	above Uravan	8.3	0.9- 63.0	39
#20	below Uravan	25.6	0.0-150.0	39
Dolores River				
#21	at Bedrock	7.8	0.9- 12.0	9
#26	at Gateway	7.1	0.1- 24.0	39
Gunnison River				
#22	on Tomichi Creek		no samples collected	
#24	above Gunnison	1.2	0.5- 2.6	9
#25	below Gunnison	2.1	0.9- 3.2	9
# 5	at Grand Junction	8.1	0.7- 13.0	9
Colorado River (Upper Basin)				
# 1	at Silt	2.6	0.1- 3.9	9
# 4	at De Beque	3.7	0.4- 6.5	9
# 6	at Fruita	7.7	4.0- 10.0	9
# 9	above Moab	9.8	4.1- 15.0	39
#10	below Moab	11.5	3.9- 22.0	35
Animas River				
#11	above Durango	1.3	0.2- 2.5	9
#12	Colorado-New Mexico line	4.9	0.4- 18.0	28
San Juan River				
#13	above Farmington	4.0	0.8- 8.3	9
#14	below Farmington	5.6	1.9- 9.0	9
#14S	below Shiprock	10.6	2.3- 16.0	9
#15	above Mexican Hat	8.6	5.7- 13.0	9
#16	below Mexican Hat	9.3	0.2- 15.0	9

Table II (continued)

	RMN Location	Avg. Uranium µg/l	Range µg/l	No. of Analysis
Green River				
#28	below Maybell	3.0	1.2- 8.0	9
#29	at Green River	5.4	1.6- 7.6	9
Colorado River (Lower Basin)				
#31	at Page	12	11 - 13	2
#32	Lake Mead	8	8 - 10	4
#33	Lake Havasu	10.0	8.2- 11.0	5
#30	at Yuma	9.2	8.0- 11.0	9


2.0
1.0
0.1
0.01
RADIUM 226
MICROMICROGRAMS PER LITER
RMN 20
RMN 18
RMN 17
1000
500
0
RIVER FLOW
MEAN CFS EACH MONTH
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1961
1962
1963
RMN 20
Uravan Mill
RMN 18
Dolores River
San Miguel River
Naturita Mill
RMN 17
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM 226
SAN MIGUEL RIVER
JANUARY, 1964
FIGURE 3


4.0
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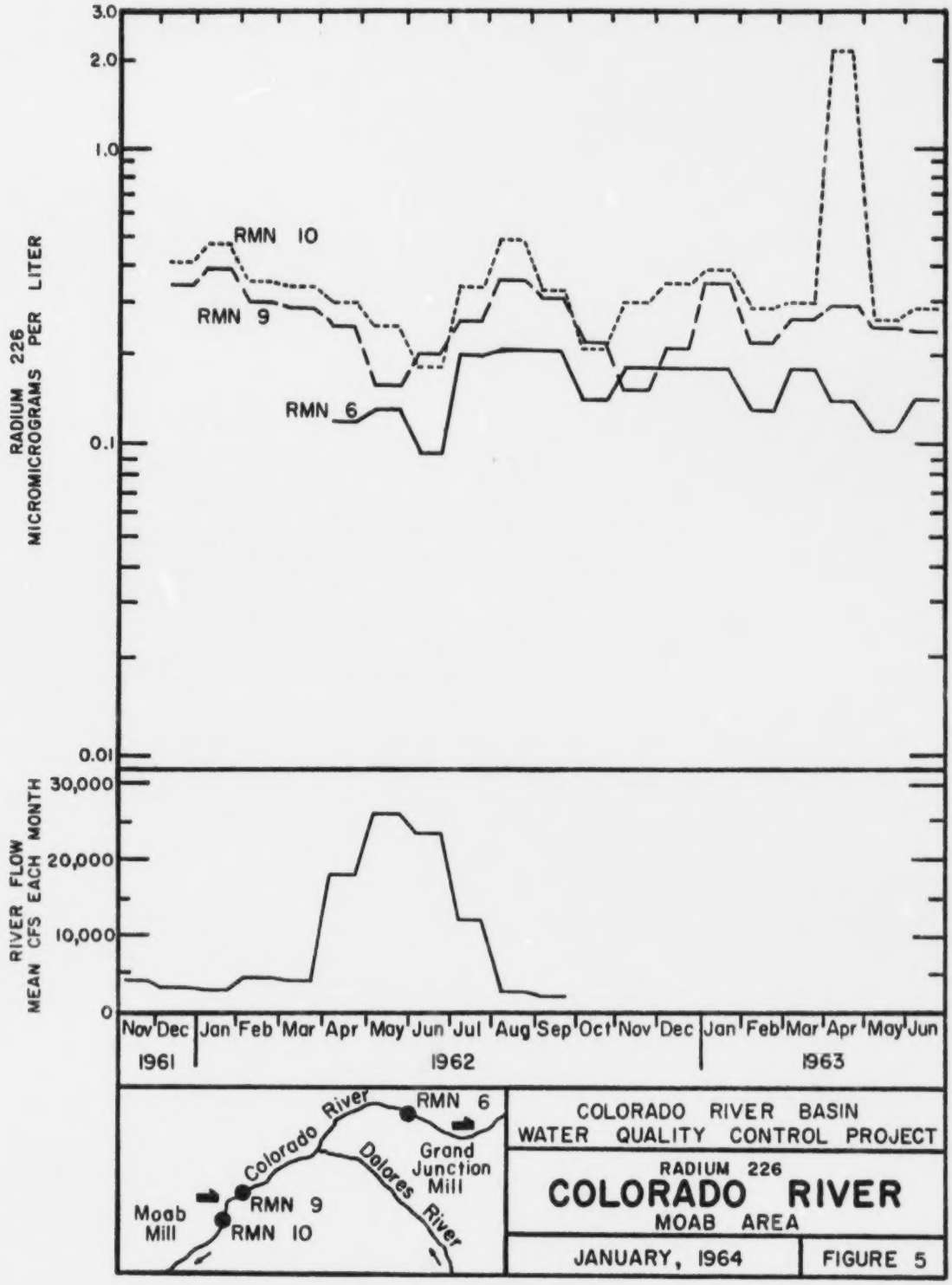
0.1
0.01
RADIUM 226
MICROMICROGRAMS PER LITER
RMN 26
RMN 21
3000
2000
1000
0
RIVER FLOW
MEAN CFS EACH MONTH
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1961
1962
1963
RMN 26
Dolores River
San Miguel
Uravan Mill
RMN 21
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM 226
DOLORES RIVER
JANUARY, 1964
FIGURE 4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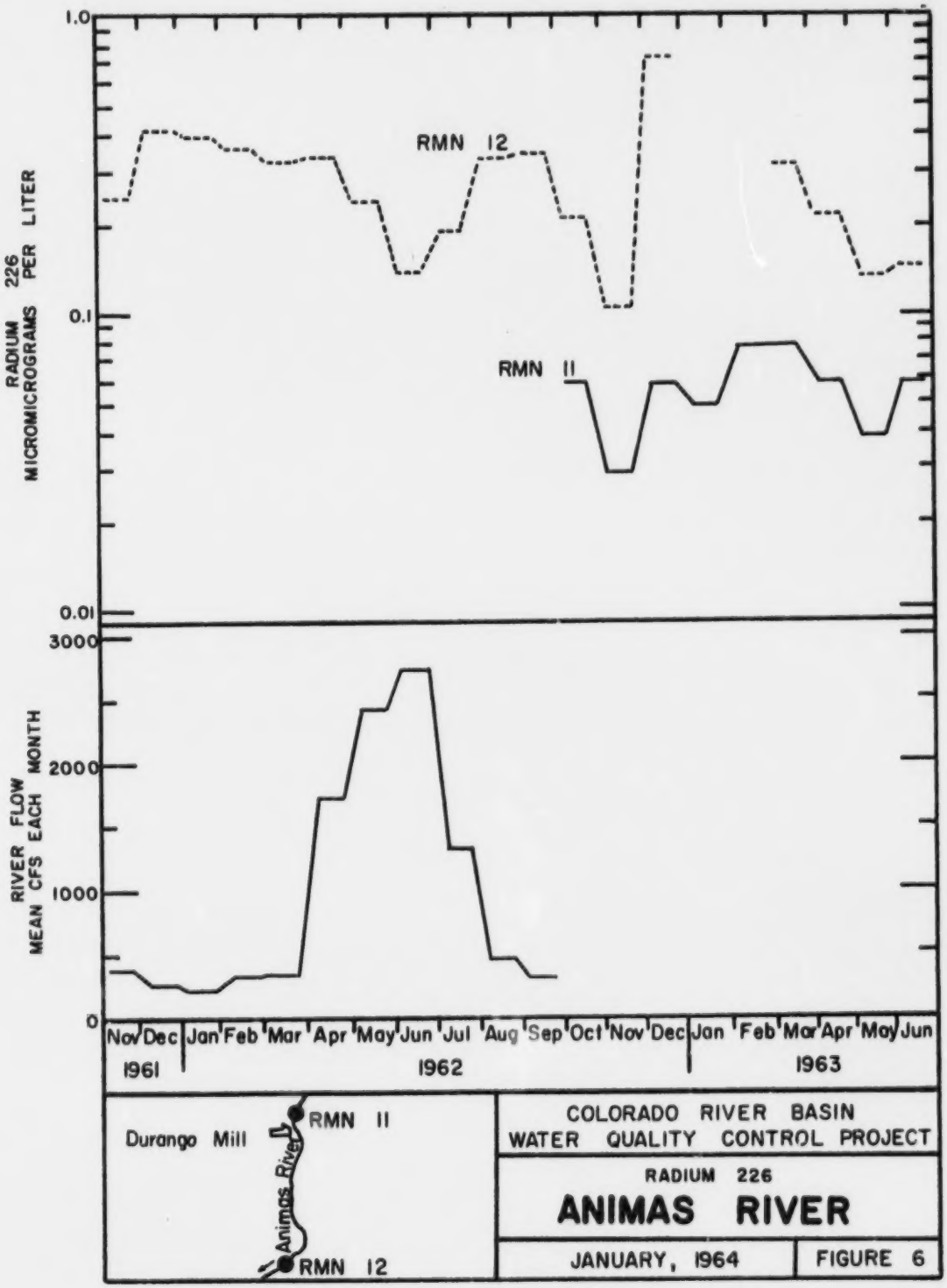
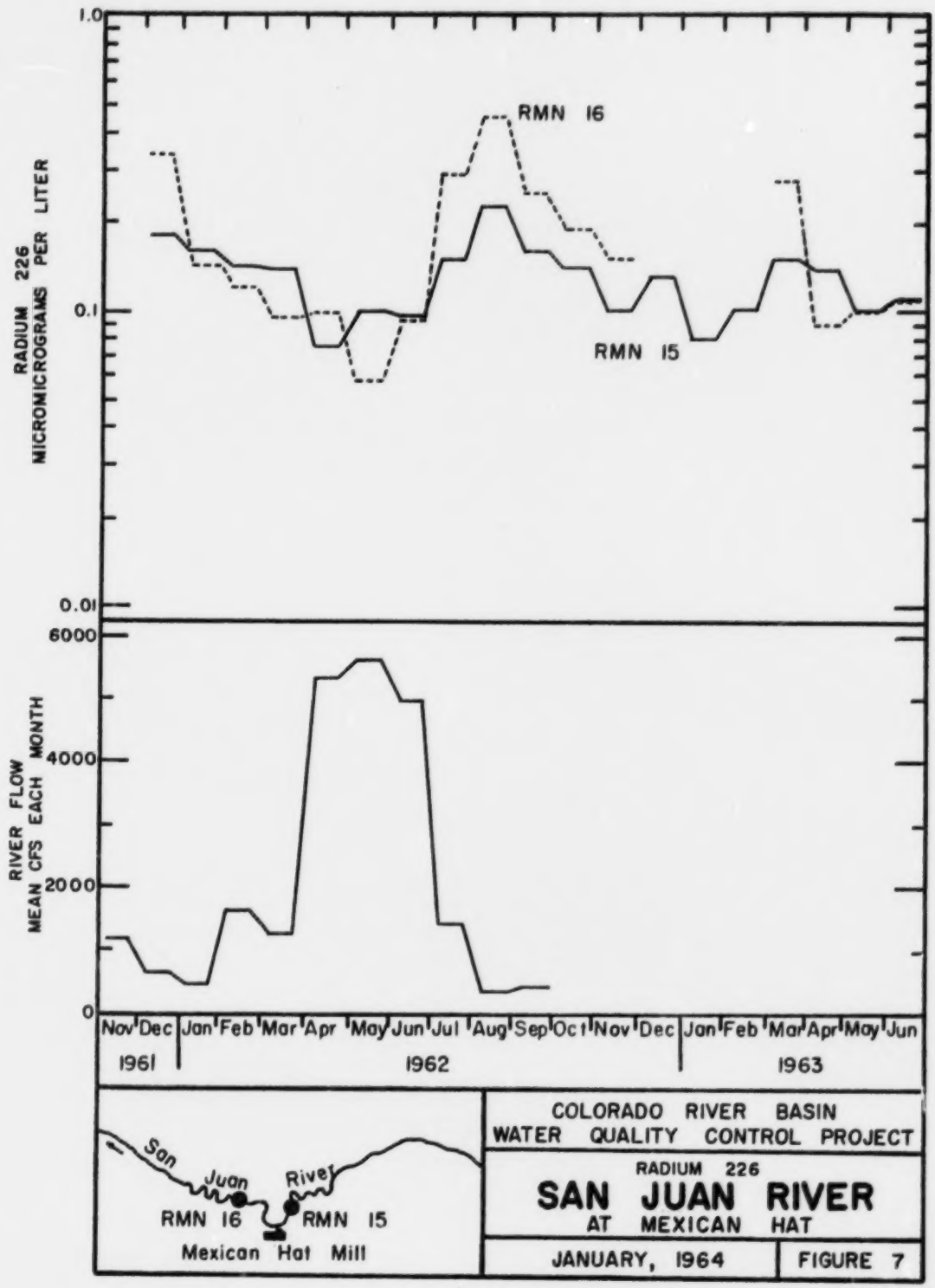
2.0
1.0
0.1
0.01
RADIUM 226
MICROMICROGRAMS PER LITER
RMN 10
RMN 9
RMN 6
30,000
20,000
10,000
0
RIVER FLOW
MEAN CFS EACH MONTH
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1961
1962
1963
Colorado River
RMN 6
Grand Junction Mill
Dolores River
Moab Mill
RMN 9
RMN 10
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM 226
COLORADO RIVER
MOAB AREA
JANUARY, 1964
FIGURE 5


1.0
0.1
0.01
RADIUM 226
MICROMICROGRAMS PER LITER
RMN 12
RMN 11
3000
2000
1000
0
RIVER FLOW
MEAN CFS EACH MONTH
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1961
1962
1963
Durango Mill
RMN 11
Animas River
RMN 12
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM 226
ANIMAS RIVER
JANUARY, 1964
FIGURE 6


1.0
0.1
0.01
RADIUM 226
MICROMICROGRAMS PER LITER
RMN 16
RMN 15
6000
4000
2000
0
RIVER FLOW
MEAN CFS EACH MONTH
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1961
1962
1963
San Juan River
RMN 16
RMN 15
Mexican Hat Mill
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM 226
SAN JUAN RIVER
AT MEXICAN HAT
JANUARY, 1964
FIGURE 7

GPO 839-926

APPENDIX

This Appendix contains appended data to that released in Data Release Nos. 1, 2 and 3, dated October 1962, January 1963, and July 1963, respectively.

TABLE III

Lead 210
Colorado River Basin

	RMN Location	Collection Period	Lead 210 μμc/l
# 6	at Fruita	7/2/62-7/28/62	<0.02
#16	below Mexican Hat	7/2/62-7/28/62	0.02
#20	below Uravan	7/1/62-7/28/62	0.22
#26	at Gateway	7/2/62-7/28/62	0.09
#28	at Maybell	7/2/62-7/28/62	0.07

TABLE IV

Gross Alpha
in Suspended Solids

Colorado River Basin

	RMN Location	Collection Period	Gross Alpha μμc/g	Gross Alpha μμc/l
# 9	above Moab	12/31/62-2/2/63	710	150
		2/ 4/63-3/2/63	100	39
#10	below Moab	12/31/62-2/2/63	470	59
		2/ 4/63-3/2/63	100	32
#15	above Mexican Hat	12/31/62-2/2/63	17	1.5
		2/ 4/63-3/2/63	16	17
#16	below Mexican Hat	12/31/62-2/2/63	7,000	1,400
		2/ 1/63-3/2/63	350	450
#18	above Uravan	2/ 3/63-3/3/63	41	4.7
#20	below Uravan	2/ 3/63-3/3/63	3,800	1,100

RMN Station 1: Colorado River at Silt, Colorado
Started: November 25, 1961
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 30-April 27	0.23	2.6
April 27-June 1	0.10	0.1
June 1-June 29	0.13	0.8

RMN Station 4: Colorado River above DeBeque, Colorado
Started: November 12, 1961
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 30-April 27	0.20	3.2
April 27-June 1	0.16	0.4
June 1-June 29	0.15	0.7

RMN Station 5: Gunnison River above Grand Junction, Colorado
Started: April 16, 1962
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 4-March 30	0.08*	10
April 1-April 27	0.09	4.7
April 29-June 1	0.06	2.9
June 1-June 29	0.08	0.7

* Amended from 0.18 as reported RMN Data Release No. 3

RMN Station 6: Colorado River near Fruita, Colorado
Started: April 16, 1962
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 5-March 30	0.18*	8.1
April 1-April 27	0.14	6.2
April 29-June 1	0.11	4.0
June 3-June 29	0.14	4.7

* Amended from 0.04 as reported RMN Data Release No. 3

RMN Station 9: Colorado River above Moab, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 6	0.31	5.3
April 8-April 13	0.25	6.4
April 15-April 20	0.26	6.2
April 22-April 27	0.35	8.1
April 29-May 4	0.34	14.0
May 6-May 11	0.26	8.2
May 13-May 18	0.21	7.0
May 20-May 25	0.20	7.4
May 27-June 1	0.23	7.5
June 3-June 8	0.24	4.1
June 10-June 15	0.26	4.7
June 17-June 22	0.21	4.7
June 24-June 29	0.26	5.4

RMN Station 10: Colorado River below Moab, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 6	0.29	5.4
April 8-April 13	0.34	7.0
April 15-April 20	0.78	8.9
April 22-April 27	7.21*	20.0
April 29-May 4	0.38	13.0
May 6-May 11	0.30	12.0
May 13-May 18	0.19	7.8
May 20-May 25	0.23	6.9
May 27-June 1	0.24	7.3
June 3-June 8	0.23	3.9
June 10-June 15	0.30	5.4
June 17-June 22	0.30	5.7
June 24-June 29	0.31	6.8

* Value checked and correct within experimental error.

RMN Station 11: Animas River at Durango, Colorado
Started: July 17, 1961
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 26	0.06	0.2
April 29-May 31	0.04	2.5
June 3-June 28	0.06	0.9

RMN Station 12: Animas River at Colorado-New Mexico State Line
Started: January 19, 1961
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1	0.23	1.9
April 8	0.21	1.6
April 15	0.23	1.5
April 22	0.20	1.8
April 29	0.21	3.4
May 6	0.20	3.2
May 13	0.15	2.7
May 20	0.10	1.8
May 27	0.09	2.0
June 3	0.13	1.6
June 10	0.11	2.3
June 17	0.16	0.4
June 23	0.19	0.5

RMN Station 13: San Juan River above Farmington, New Mexico
Started: July 9, 1962
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 26	0.06	0.8
April 29-May 31	0.05	3.6
June 3-June 23	0.06	1.9

RMN Station 14: San Juan River at Fruitland, New Mexico
Started: August 1, 1962
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 26	0.16	1.9
April 29-May 31	0.13	3.2
June 3-June 23	0.14	2.8

RMN Station 14S: San Juan River below Shiprock, New Mexico
Started: August 7, 1962
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
April 1-April 26	0.16	2.3
April 29-May 31	0.14	11.0
June 3-June 23	0.16	7.5

RMN Station 15: San Juan River above Mexican Hat, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1962		
December 3-December 29	0.13*	9.8
1963		
April 1-April 27	0.14	5.7
April 29-June 1	0.10	5.9
June 3-June 29	0.11	5.7

* Amended from 0.09 to 0.13 as reported RMN Data Release No. 3

RMN Station 16: San Juan River below Mexican Hat, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1962		
December 3-December 29	0.61*	9.0
1963		
April 1-April 27	0.09**	14.0
April 29-June 1	0.10	6.2
June 3-June 29	0.11	6.0

* Amended from 0.53 as reported RMN Data Release No. 3
** Value checked and correct within experimental error.

RMN Station 17: San Miguel River above Naturita, Colorado
Started: October 28, 1961
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 30-April 27	0.05	0.1
April 27-June 2	0.05	0.0
June 2-June 30	0.05	0.5

RMN Station 18: San Miguel River above Uravan, Colorado
Started: October 27, 1961
Type: Automatic Pump-Timer

Date 1963	Radium-226 μμc/liter	Uranium μg/liter
March 3-March 9	0.31	16.0
March 9-March 18	0.78	12.0
March 18-March 23	0.21	4.8
March 23-March 30	0.23	2.7
March 30-April 7	0.40	1.2
April 7-April 13	0.19	1.6
April 13-April 21	0.21	4.0
April 21-April 27	0.20	5.9
April 27-May 5	0.28	2.0
May 5-May 11	0.33	2.6
May 11-May 19	0.34	0.8
May 19-May 26	0.26	2.5
May 26-June 2	0.25	1.9
June 2-June 9	0.28	3.2
June 9-June 16	0.24	0.9
June 16-June 23	0.28	1.6
June 23-June 30	0.36	2.7

RMN Station 20: San Miguel River below Uravan, Colorado
Started: October 9, 1961
Type: Automatic Pump-Timer

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 3-March 9	0.94	57.0
March 9-March 18	2.33	33.0
March 18-March 23	0.24	6.6
March 23-March 30	0.40	9.7
March 30-April 7	1.25	41.0
April 7-April 13	1.06	19.0
April 13-April 21	1.06	1.3
April 21-April 27	1.19	0.7
April 27-May 5	0.81	0.2
May 5-May 11	1.34	2.5
May 11-May 19	2.80	29.0
May 19-May 26	1.48	15.0
May 26-June 2	0.85	4.9
June 2-June 9	1.46	5.1
June 9-June 16	0.26	0.0
June 16-June 23	0.63	0.0
June 23-June 30	0.44	2.0

RMN Station 21: Dolores River at Bedrock, Colorado
Started: October 30, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 3-March 30	0.59	9.8
April 1-April 27	0.15	2.9
April 29-June 1	0.03	0.9
June 3-June 29	0.50	6.3

RMN Station 24: Gunnison River above Gunnison, Colorado
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 4-March 30	0.08	0.7
April 1-April 27	0.03	0.5
April 29-June 1	0.03	0.9
June 3-June 29	0.04	0.6

RMN Station 25: Gunnison River below confluence of Tomichi Creek, Gunnison, Colorado
Started: December 5, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 4-March 30	0.06	2.0
April 1-April 27	0.04	0.9
April 29-June 1	0.06	0.4
June 3-June 29	0.06	1.0

RMN Station 26: Dolores River at Gateway, Colorado
Started: December 26, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 4-March 10	1.08	0.8
March 11-March 16	1.51	0.1
March 18-March 24	1.29	1.3
March 25-March 30	0.51	5.5
April 1-April 6	0.43	11.0
April 8-April 14	0.50	12.0
April 15-April 20	0.38	12.0
April 22-April 28	0.99	3.0
April 29-May 4	0.79	2.9
May 6-May 11	0.64	7.0
May 13-May 18	0.49	4.3
May 20-May 25	0.61	4.7
May 27-June 1	0.79	2.6
June 2-June 8	0.96	1.4
June 10-June 15	0.93	3.5
June 17-June 22	0.96	4.4
June 24-June 29	0.91	3.2

RMN Station 28: Yampa River below Maybell, Colorado
Started: July 2, 1962
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 4-March 29	0.06	8.0
April 1-April 26	0.06	1.5
April 29-May 31	0.08	1.8
June 3-June 28	0.05	1.2

RMN Station 29: Green River below Green River City, Utah
Started: July 16, 1962
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
December 31-January 4	0.10	6.6
January 9-February 2	0.10	5.3
February 8-February 27	0.09	5.1
March 4-March 29	0.09	7.6
April 1-April 26	0.08	3.2
April 29-May 31	0.08	1.6

RMN Station 30: Colorado River at U. S.-Mexican Border
Started: June 19, 1961
Type: Five grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
December 31-February 1	0.06	9.5
February 4-March 1	0.13	11.0
March 4-March 29	0.20	8.8
April 1-April 26	0.21	9.2
April 29-May 31	0.12	9.6
June 3-June 28	0.32	9.2

RMN Station 31: Colorado River at Page, Arizona
Started: May 1, 1963
Type: 300 cc. composite per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
May 6-May 27	0.36	13
June 1-June 30	0.29	11

RMN Station 32: Colorado River at (Lake Mead) Boulder City, Nevada
Started: March 11, 1963
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 11-March 29	0.38	10.0
April 1-April 26	0.38	8.8
April 29-May 31	0.36	8.0
June 3-June 28	0.40	7.8

RMN Station 33: Colorado River at Metropolitan Water District Intake, Lake Havasu, California-Arizona
Started: January 7, 1963
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium μg/liter
1963		
March 3-March 28	0.38	11.0
April 1-April 26	0.38	9.9
May 1-May 24	no results	
June 3-June 29	0.40	8.2